

What is claimed:

1. A system for preventing a call drop between a hybrid access terminal and a CDMA 2000 1xEV-DO (Evolution-Data Optimized) system by restricting overhead messages when the hybrid access terminal is periodically switched into a CDMA 2000 1X mode in traffic with the 1xEV-DO system, the system comprising:

the hybrid access terminal operated in the 1X mode in relation to a 1X system for receiving a voice signal transmission service or a low-rate data transmission service from the 1X system and in the 1xEV-DO mode in relation to the 1xEV-DO system for receiving a high-rate data transmission service from the 1xEV-DO system, the hybrid access terminal being periodically switched into the 1X mode in traffic with the 1xEV-DO system so as to receive the overhead messages and returning to the 1xEV-DO mode if predetermined essential overhead messages are received;

a base station transceiver subsystem including a 1xEV-DO access network transceiver for transmitting/receiving packet data to/from the hybrid access terminal and a 1X transceiver for transmitting/receiving voice or data to/from the hybrid access terminal;

a base station controller including a 1xEV-DO access network controller for controlling a packet data transmission service of the 1xEV-DO access network transceiver and a 1X controller for controlling a

transmission service of the 1X transceiver; and

a packet data serving node (PDSN) connected to the 1xEV-DO access network controller so as to transmit/receive the packet data to/from the 1xEV-DO system.

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2. The system as claimed in claim 1, wherein the overhead messages include a system parameter message, an access parameter message, an extended system parameter message, a neighbor list parameter message, and a channel list parameter message.

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3. The system as claimed in claim 1 or 2, wherein the predetermined essential overhead messages include the system parameter message and the access parameter message.

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4. The system as claimed in claim 3, wherein, when all overhead essential messages are received in the hybrid access terminal, the hybrid access terminal stops message receiving work and returns to the 1xEV-DO mode.

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5. The system as claimed in claim 1, wherein the hybrid access terminal is set as the 1X mode in an idle state thereof in order to make communication with the 1X system and is periodically switched into the 1xEV-DO mode in a predetermined period of time so as to check whether or not data are received through the 1xEV-DO system and returns to the 1X mode.

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6. The system as claimed in claim 1, wherein the hybrid access terminal receiving high-rate data from the 1xEV-DO system in the 1xEV-DO mode is periodically switched into the 1X mode in a predetermined period of time so as to check whether or not signals are received through the 1X system and returns to the 1xEV-DO mode.

7. The system as claimed in claim 1, wherein a TDMA (time division multiple access) method is utilized in a case of a forward link transmitting data from the 1xEV-DO system to the hybrid access terminal, and a CDMA (code division multiple access) method is utilized in a case of a reverse link transmitting data from the hybrid access terminal to the 1xEV-DO system.

8. The system as claimed in claim 7, wherein a hard handoff is carried out in case of the forward link by transmitting data with maximum power without performing power control, and a soft handoff is carried out in case of the reverse link while performing the power control with respect to each hybrid access terminal.

9. The system as claimed in claim 1, wherein the hybrid access terminal is switched from the 1xEV-DO mode into the 1X mode by tracking frequency of the 1X system using a searcher module under the control of a mobile

station modem (MSM) chip.

10. The system as claimed in claim 7, wherein the forward link includes a pilot channel used for transmitting a pilot signal allowing the 1xEV-DO system to track the hybrid access terminal, a MAC (medium access control) channel used for controlling the reverse link, a control channel used for transmitting a broadcast message or a direct message for directly controlling a specific hybrid access terminal from the 1xEV-DO system to the hybrid access terminal, and a traffic channel used for transmitting only packet data from the 1xEV-DO system to the hybrid access terminal.

11. A method for preventing a call drop between a hybrid access terminal and a 1xEV-DO (Evolution-Data Optimized) system by restricting overhead messages when the hybrid access terminal in traffic with the 1xEV-DO system is periodically switched into a 1X mode, the method comprising the steps of:

(a) sequentially initializing the 1X mode and a 1xEV-DO mode of the hybrid access terminal such that the hybrid access terminal stays in an idle state;

(b) performing dual monitoring with respect to the 1X mode and the 1xEV-DO mode by using the hybrid access terminal in a state that the hybrid access terminal stays in the idle state;

(c) allowing the hybrid access terminal to enter into a traffic state of the 1xEV-DO mode such that a connection and a session are established between the hybrid access terminal and the EV-DO system, thereby enabling the hybrid access terminal to transmit/receive packet data to/from the EV-DO system;

(d) switching the hybrid access terminal into the 1x mode if a predetermined monitoring time lapses;

(e) switching the hybrid access terminal into the 1x mode and allowing the hybrid access terminal to receive the overhead messages; and

(f) allowing the hybrid access terminal to return to the 1xEV-DO mode if the hybrid access terminal receives all predetermined essential overhead messages.

12. The method as claimed in claim 11, wherein, in step (a), the hybrid access terminal initializes the 1xEV-DO mode by using system parameters obtained when initializing the 1X mode.

13. The method as claimed in claim 11, wherein, in step (d), the predetermined monitoring time is 5.12 seconds, which is counted after the hybrid access terminal returns to the 1xEV-DO mode.

14. The method as claimed in claim 11, wherein, in step (d), switching the hybrid access terminal into the 1x

mode is performed through a searcher module, which tracks frequencies used in the 1X system under a control of an MSM chip accommodated in the hybrid access terminal.

5 15. The method as claimed in claim 11, wherein, in step (e), the hybrid access terminal demodulates the received overhead messages to store the demodulated overhead messages in a predetermined memory.

10 16. The method as claimed in claim 11, wherein, in step (f), the essential overhead messages include a system parameter message and an access parameter message.

15 17. The method as claimed in claim 11, wherein, in step (f), an operation of allowing the hybrid access terminal to return to the 1xEV-DO mode is performed through a searcher module, which tracks frequencies used in the 1xEV-DO system under a control of an MSM chip accommodated in the hybrid access terminal.

20 18. The method as claimed in claim 11, wherein the hybrid access terminal uses the essential overhead messages received and stored during a previous search of the 1X system for a next search of the 1X system.

25 19. A hybrid access terminal which returns to a 1xEV-DO mode if predetermined conditions are satisfied by

checking overhead messages received therein after being switched into a 1X mode, the hybrid access terminal comprising:

5 a timer repeatedly measuring a monitoring time in order to perform dual monitoring between a 1xEV-DO system and a 1X system;

10 a searcher module for tracking and converting frequency so as to perform the switching of the hybrid access terminal between the 1X mode and the 1xEV-DO mode in hardware, and receiving an overhead message;

a finger module for demodulating the overhead message received through the searcher module; and

15 an MSM (mobile station modem) chip for controlling the switching through software, controlling transmission/receiving of data between the hybrid access terminal and the 1X system and the 1xEV-DO system, and controlling the hybrid access terminal in such a manner that the hybrid access terminal returns to the 1xEV-DO mode if a predetermined essential overhead messages are received when
20 the hybrid access terminal has been switched into the 1X mode.

25 20. The hybrid access terminal as claimed in claim 19, wherein the hybrid access terminal searches frequencies used in the 1X system or the 1xEV-DO system according to a predetermined monitoring period so as to be operated in the 1X mode or 1xEV-DO mode.

21. The hybrid access terminal as claimed in claim 19,
wherein the hybrid access terminal demodulates the received
essential overhead messages to store the demodulated
essential overhead messages in a predetermined memory.

22. The hybrid access terminal as claimed in claim 19,
wherein the hybrid access terminal uses the essential
overhead messages received and stored during a previous
search of the 1X system for a next search of the 1X system.

23. The hybrid access terminal as claimed in claim 19,
wherein the hybrid access terminal, which stores the
essential overhead messages, returns to a state allowing the
hybrid access terminal to respond to a voice call from the
1X system or perform a location register in the 1X system if
the hybrid access terminal receives remaining overhead
messages.